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less the nematocysts have important defensive value to the flatworm.

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July 15, 1911

SCIENTIFIC BOOKS

Convergence in Evolution. By ARTHUR WILLEY. London, John Murray. Pp. 177, 12 figs. 1911.

In "Convergence in Evolution" Professor Willey has written an illuminating exposition of the wide-spread occurrence of convergence in animal structure and habit, and a strong argument for a fairer recognition of its validity and importance. Indeed, this argument is sometimes so strong, at least in its wording, that it seems almost to overshoot the mark. It makes convergence seem too important, too dominant, too universal, to be true. For example—perhaps a slightly unfair one, wrested thus from its context—Professor Willey says of histologic identity:

In the light of facts which are now available it even begins to appear strange, although only a matter of a few years or months ago, that histological identity should ever have been insisted upon as a criterion of homology except within well-defined limits (p. 153).

But despite his enthusiasm for convergence and his avowed intent to unseat homology from its high place, Professor Willey never means to be unfair. He is simply a convinced believer, a positive expositor and a strong debater. He asks only for a recognition of the facts. He has no laws of convergence to offer any more than he will agree to accept any one universal criterion of homology.

Then away with laws and away with criteria until they cease to obscure the facts as they are (p. 170).

The book is thoroughly interesting reading for a zoologist. It is a mine of illustrations of adaptive convergence. Indeed, it might be offered as a reference book of animal adaptations. Examples of extraordinary similarities in superficial and histologic structure in all parts of the bodies of animals of all the phyla

crowd the pages of the book. For not a few of these the author is able to draw on his own contributions to the knowledge of animal morphology. For the others he usually gives satisfactory references.

I am tempted to take out of the book some of the choice examples. But I shall be doing my readers a greater favor if by refraining from doing this, and at the same time telling them how interesting and suggestive many of these examples are, I can induce them to see the whole book. To read it as a whole is the more desirable also because of the unusually independent and original points of view from which the author examines many current biological theories and problems. Indeed the book is so refreshing and stimulating in its forthright outspokenness with regard to much that many of us feel insurgent about but hesitate to speak out about, that it is worth while for this alone. All the convergence in it will be surplus for your money!

Just one thing to act as "snapper" at the end of this otherwise unmitigated enthusiasm of commendation. The style in which the book is written is unfortunate. Not as to sentence construction, paragraphs, grammar, punctuation, but as to abruptness of attack and of leaving off; of pertinence of matter to subject, of illustration to point. One loses his bearings too often in the book. One wonders whether this example belongs to the subject behind it or to the one in front of it. Or indeed whether it belongs in the book at all. But readers of scientific books are, from long experience, immune to most of the difficulties which unusual manners of writing can present. They are accustomed to dig their gold wherever and however they find it concealed. And Professor Willey's book has much good gold in it for any digger.

V. L. K.

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A Monograph of the Naiades of Pennsylvania. By ARNOLD E. ORTMANN, Ph.D. Memoirs of the Carnegie Museum, IV., No. 6, February, 1911, pp. 279-347; pl. 86-89; 4to.

This memoir—confined to a discussion of the anatomical characters, especially the structure of the gills, and to an arrangement of the different groups in conformity with the data newly obtained or now correlated by Dr. Ortmann—comprises an important advance in our knowledge of the fresh-water mussels. Giving full credit to Lea and Simpson, pioneers in the classification of these animals on the basis of the characteristics of the reproductive organs and marsupium, the author's studies of the microscopic structure of these organs have enabled him to rectify some errors and add very largely to the available data. The details are well illustrated both by text figures and excellent plates. The description and illustration of the Pennsylvanian species is reserved for future publication.

Dr. Ortmann, on account of certain archaic features, proposes for *Magaritana* a separate family, retaining the other Pennsylvanian forms in the Unionidæ which he divides into three subfamilies. He proposes a new genus *Paraptera* for *Lampsilis gracilis* (Barnes) on account of peculiarities of the glochidia. We note that he adopts for the group commonly known as *Glabaris* the name of *Anodontites* which was first applied by Bruguière. This name is undoubtedly prior to any other for the group in question, but by the rules in vogue, at the time it was proposed the termination *ites* was reserved for fossil species, and it was therefore not adopted. If *Anodontites* be rejected *Patularia* Swainson precedes *Glabaris* in date.

WM. H. DALL

The Sources and Modes of Infection. By CHARLES V. CHAPIN, M.D., Sc.D., Superintendent on Health, Providence, R. I., author of *Municipal Sanitation in the United States*. New York, John Wiley and Sons; London, Chapman and Hall, Limited. Octavo. Pp. ix + 399. 1910.

Any book written by this author is worthy of attention, and this one especially so—for in it is contained a summary of our knowledge of the subjects of which it treats and the interpretation put upon this knowledge by one

possessed of wide experience. Some of the conclusions arrived at will be startling to those unfamiliar with the general trend of modern thought, but none are put forward that are not logically in sequence to the evidence presented. It will be difficult to secure general acceptance of such conclusions as this (p. 28): "While municipal improvements, such as the above" (cleaning of streets, back alleys, etc., regulation of offensive trades and prevention of nuisances generally), "are advisable, there is little more real reason why health officials should work for them, than there is that they should work for free transfers, cheaper commutation tickets—all good things in their way and tending towards comfort and health." Yet the author brings forward apparently good evidence to show that such statements are warranted. Perhaps the most valuable chapter is the second—in which stress is laid upon "carriers and missed cases" as most important sources of infection. Attention is called to the great influence of infection by contact—the comparative slight importance of infection by fomites or by air; instances are given of the favorable results following the abandonment of disinfection in certain of the infectious diseases in Providence, and a proper amount of stress is laid upon the transmission of certain diseases by insects. For all who are interested in these subjects the book will be a valuable aid in recognizing the present evidence upon which the control of infectious diseases must rest.

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BOTANICAL NOTES

A READABLE BOOK

AMONG the most readable of recent botanical books is that on "The Evolution of Plants," by President D. H. Scott, of the Linnean Society of London (New York, Holt). In about two hundred and fifty duodecimo pages the author discusses the evolution of plants most entertainingly and lucidly, confining himself, however, to the flowering plants and the "higher spore plants."